

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-26. (Cancelled)

27. (Currently amended) A system for obtaining a spatially-resolved image of signals indicative of the presence of [[a]] at least one substance, comprising

- a) a sheet of diffusion-controlling matrix of dimensions sufficient to permit bringing material to be detected into contact with at least one spatially-discrete area of said sheet, said matrix being selected from the group consisting of secondary valence gels, synthetic polymer gels and viscous solutions;
- b) at least one biological sensor material suspended throughout said sheet of diffusion-controlling matrix and capable of producing at least one signal in response to the presence of [[a]] at least one substance which is in contact with at least one spatially-discrete area of said sheet of diffusion-controlling matrix, said at least one biological sensor material being bioluminescent cells with reporter gene constructs, and
- c) means for detecting the spatial distribution, relative to said sheet of diffusion-controlling matrix, of signal(s) produced in said sheet of diffusion-controlling matrix by said biological sensor material when said at least one substance is in contact with at least one spatially-discrete area of said sheet of diffusion-controlling matrix.

28. (Previously presented) The system of claim 27 further comprising a carrier for the substance to be detected, said carrier being in contact with said sheet of diffusion-controlling matrix such that a substance to be detected which is located on said carrier is in contact with at least one spatially-discrete area of said diffusion-controlling matrix.

29. (Previously presented) The system of claim 27 wherein said secondary valence gel is agarose.

30. (Previously presented) The system of claim 27 wherein said synthetic polymer gel is a polyacrylate.

31. (Previously presented) The system of claim 27 wherein at least one biological sensor material is employed in addition to said bioluminescent cells with reporter gene constructs, and this additional biological sensor material is selected from the group consisting of subcellular particles, enzymes, antibodies, fluorescent materials, and indicator dyes.

32. (Previously presented) The system of claim 27 wherein more than one type of bioluminescent cells is employed.

33. (Previously presented) The system of claim 27 wherein said bioluminescent cells are capable of producing a plurality of different signals simultaneously.

34. (Previously presented) The system of claim 27 wherein said diffusion-controlling matrix further comprises at least one additive which influences the detection sensitivity, the selectivity, or the kinetics of the diffusion-controlling matrix.

35. (Previously presented) The system of claim 34 wherein said additive is a buffer for regulating the vitality of biological sensor cells.

36. (Previously presented) The system of claim 27 wherein said diffusion-controlling matrix further comprises a bioluminescent substrate, a chemiluminescent reagent or a fluorescent reagent.

37. (Previously presented) The system of claim 27 comprising a plurality of sheets of diffusion-controlling matrices containing different constituents.
38. (Previously presented) The system of claim 27 wherein said diffusion-controlling matrix contains 2 to 8 ml of reporter gene suspension per 50 ml of matrix composition.
39. (Previously presented) The system of claim 27 wherein said diffusion-controlling matrix contains 3 to 5 ml of reporter gene suspension per 50 ml of matrix composition.
40. (Previously presented) The system of claim 27 wherein said sheet of diffusion-controlling matrix containing said biological sensor has an optical density of 0.6 to 1.4 at 660 nm.
41. (Previously presented) The system of claim 27 wherein said sheet of diffusion-controlling matrix has a thickness of 0.1 to 10.0 mm.
42. (Previously presented) The system of claim 41 wherein said sheet of diffusion-controlling matrix has a thickness of 0.5 to 3 mm.
43. (Previously presented) The system of claim 42 wherein said sheet of diffusion-controlling matrix has a thickness of 0.5 to 0.8 mm.
44. (Cancelled)